

CLAIMS

1. A liquid crystal display device comprising:  
a liquid crystal cell comprising a pair of  
substrates and a liquid crystal layer arranged between  
5 the pair of substrates;  
first and second polarizers arranged on  
either side of the liquid crystal cell;  
a first retardation plate arranged between  
the liquid crystal cell and the first polarizer;  
10 a second retardation plate arranged  
between the liquid crystal cell and the second polarizer;  
each of the first and second retardation  
plates having an optical axis in a plane parallel to the  
surfaces of the substrates and a retardation of  
15 substantially  $\lambda/4$ , the optical axis of the first  
retardation plate being perpendicular to the optical axis  
of the second retardation plate;  
the first and second polarizers having  
polarizing axes arranged at an angle of  $45^\circ$  with respect  
20 to the optical axes of the first and second retardation  
plates; and  
the liquid crystal cell being arranged  
such that a state of alignment of the liquid crystal  
molecules changes, accompanying change in a polar angle  
25 and/or change in an azimuth upon application of voltage.
2. A liquid crystal display device comprising:  
a liquid crystal cell comprising a pair of  
substrates and a liquid crystal layer arranged between  
the pair of substrates;  
30 first and second polarizers arranged on  
either side of the liquid crystal cell;  
a first retardation plate arranged between  
the liquid crystal cell and the first polarizer;  
a second retardation plate arranged  
35 between the liquid crystal cell and the second polarizer;  
each of the first and second retardation  
plates having an optical axis in a plane parallel to the

surfaces of the substrates and a retardation of substantially  $\lambda/4$ , the optical axis of the first retardation plate being perpendicular to the optical axis of the second retardation plate;

5                   the first and second polarizers having polarizing axes arranged at an angle of  $45^\circ$  with respect to the optical axes of the first and second retardation plates; and

10                   the liquid crystal cell being arranged such that an azimuth distribution exists in a state of alignment of the liquid crystal molecules when the liquid crystal molecules are aligned horizontally or obliquely with respect to the surfaces of the substrates.

15                   3. A liquid crystal display device according to claim 1 or 2, wherein at least a portion of the liquid crystal molecules are aligned in the azimuth except for  $45^\circ$  from the polarizing axes of the polarizers.

20                   4. A liquid crystal display device according to claim 1 or 2, wherein the liquid crystal of the liquid crystal cell is of a vertical alignment type, the liquid crystal cell includes a structure or a slit arranged on the electrode of at least one of the substrates, and a state of alignment of the liquid crystal molecules located on one side of the structure or the slit is  
25                   different from a state of alignment of the liquid crystal molecules located on the other side of the structure or slit.

30                   5. A liquid crystal display device according to claim 4, wherein liquid crystal molecules located on the structure or slit are aligned, accompanying a change in the azimuth upon application of voltage.

35                   6. A liquid crystal display device comprising:  
                    a liquid crystal cell comprising a pair of substrates and a liquid crystal layer arranged between the pair of substrates;

                    first and second polarizers arranged on either side of the liquid crystal cell;

a second retardation plate arranged between the liquid crystal cell and the second polarizer;

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surfaces of the substrates and a retardation of substantially  $\lambda/4$ , the optical axis of the first retardation plate being perpendicular to the optical axis of the second retardation plate;

5                   the first and second polarizers having polarizing axes arranged at an angle of  $45^\circ$  with respect to the optical axes of the first and second retardation plates;

10                   the liquid crystal of the liquid crystal cell being of a vertical alignment type, the liquid crystal cell including structures or slits arranged on or in an electrode of at least one of the substrates, a state of alignment of the liquid crystal molecules located on one side of the structure or the slit being  
15                   different from a state of alignment of the liquid crystal molecules located on the other side of the structure or the slit; and

20                   a retardation in the plane of the retardation plate being not less than 120 nm and not more than 160 nm.

8.   A liquid crystal display device according to claim 7, wherein an angle between the absorbing axis of the polarizer and the aligning direction or the inclining direction of liquid crystal molecules is not less than  
25                    $5^\circ$ , and the contrast characteristic is symmetrical with respect to the horizontal direction.

9.   A liquid crystal display device according to claim 7, wherein at least one optical layer having a negative retardation is arranged between the retardation  
30                   plate and the liquid crystal cell or between the retardation plate and the polarizer.

10.   A liquid crystal display device comprising:  
                    a liquid crystal cell comprising a pair of substrates and a liquid crystal layer arranged between  
35                   the pair of substrates;

                    a film causing light to scatter in a specific direction; and

the liquid crystal of the liquid crystal cell being of a vertical alignment type, the liquid crystal cell including structures or slits arranged on or in an electrode of at least one of the substrates, a state of alignment of the liquid crystal molecules located on one side of the structure or the slit being different from a state of alignment of the liquid crystal molecules located on the other side of the structure or the slit.

11. A liquid crystal display device according to claim 10, further comprising a uniaxial stretched film, a biaxial stretched film and a film having a negative retardation so that the viewing angle characteristic of the liquid crystal display can be improved.

12. A liquid crystal display device comprising:  
a liquid crystal cell comprising a pair of substrates and a liquid crystal layer arranged between the pair of substrates;

first and second polarizers arranged on either side of the liquid crystal cell;

a first retardation plate arranged between the liquid crystal cell and the first polarizer;

a second retardation plate arranged between the liquid crystal cell and the second polarizer;

each of the first and second retardation plates having an optical axis in a plane parallel to the surfaces of the substrates and a retardation of substantially  $\lambda/4$ , the optical axis of the first retardation plate being perpendicular to the optical axis of the second retardation plate;

the first and second polarizers having polarizing axes arranged at an angle of  $45^\circ$  with respect to the optical axes of the first and second retardation plates; and

the liquid crystal layer of the liquid crystal cell containing the liquid crystal and a resin coexisting with the liquid crystal.

13. A liquid crystal display device comprising:

a liquid crystal cell comprising a pair of substrates and a liquid crystal layer arranged between the pair of substrates;

5 first and second polarizers arranged on either side of the liquid crystal cell;

a first retardation plate arranged between the liquid crystal cell and the first polarizer;

10 a second retardation plate arranged between the liquid crystal cell and the second polarizer;

each of the first and second retardation plates having an optical axis in a plane parallel to the surfaces of the substrates and a retardation of substantially  $\lambda/4$ , the optical axis of the first retardation plate being perpendicular to the optical axis of the second retardation plate;

15 the first and second polarizers having polarizing axes arranged at an angle of  $45^\circ$  with respect to the optical axes of the first and second retardation plates;

20 the liquid crystal of the liquid crystal cell being of a vertical alignment type, a polymer network being formed in the liquid crystal layer of the liquid crystal cell, the pretilt of the liquid crystal molecules and an inclination direction of the liquid crystal molecules upon application of voltage being regulated by the polymer network.

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